THE AMERICAN JOURNAL
OF
OPHTHALMOLOGY.

VOL. XXII. FEBRUARY, 1905. No. 2.

ORIGINAL ARTICLES.

A NEW SERIES OF SEMAPHORE CHARTS FOR TESTING THE VISION OF RAILROAD EMPLOYES.*

By Nelson Miles Black, M. D.,

MILWAUKEE, WIS.

THE author makes no claim to originality in using test cards with semaphore figures as the idea of using figures representing the various positions of the arms of a semaphore was advanced and put into practical use by Dr. Chas. H. Williams many years ago. His charts, however, are black figures on a white background, the portion of the figure representing the arms of the semaphore subtending an angle of 0°–5′ at 20 feet and at this distance "these signals will appear of the same size as a standard semaphore arm 46 inches long, seen against a sky background, at a distance of 2600 feet." They partake, however, more of the nature of an illiterate test chart.

The figures on the cards here shown are reduced by scale by Mr. L. R. Clausen, Signal Engineer of the C. M. & St. P. R. R., and represent at 20 feet a standard semaphore pole and arm seen at one-half mile (2640 ft.), with actual colors used for the distance and home signals, placed on a neutral grayish background, which corresponds to the average tint

*Read by H. V. Würdemann at Denver, Colo., Meeting of Amer. Acad. of Ophth. and Oto-Laryng., Aug. 26, 1904.

of the horizon against which a semaphore in an ideal position is seen. In this reduced figure, at 20 feet, the arm of the semaphore subtends an angle of 0°–5′.

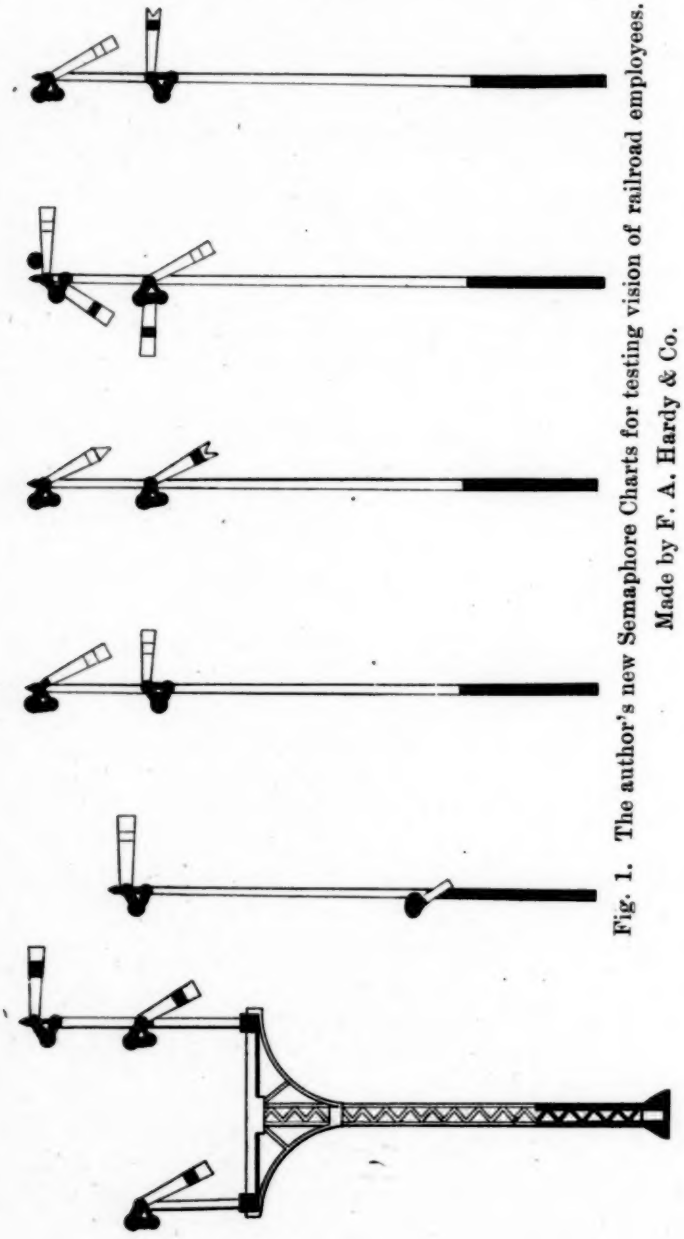


Fig. 1. The author's new Semaphore Charts for testing vision of railroad employees. Made by F. A. Hardy & Co.

One card shows single blades in various positions; another various combinations of double blades, Fig. 1; a third represents a scale reduction of the Hall or disc signal in use on many roads for block signaling, Fig. 2.

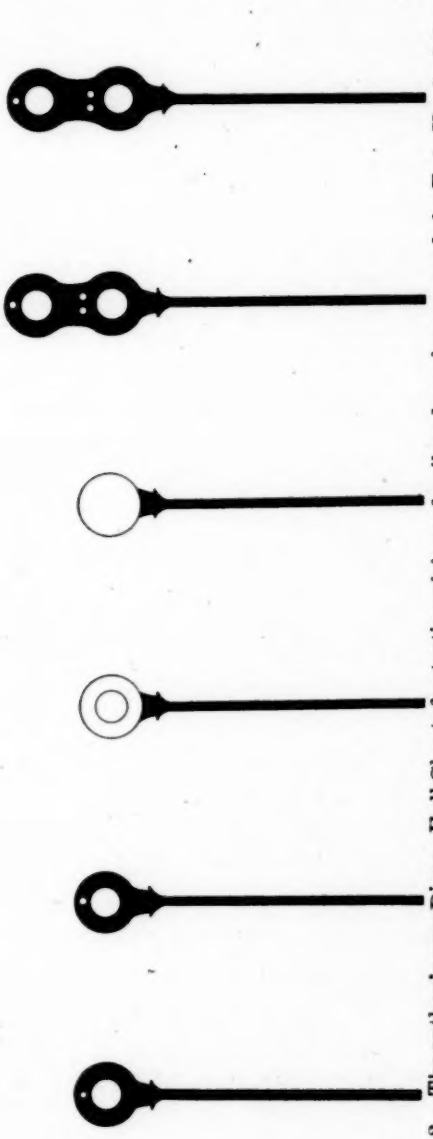


Fig. 2. The author's new Disc or Hall Charts for testing vision of railroad employees, made by F. A. Hardy & Co. The center arms in the charts are colored red and green for various indications.

Many railroad men have remarked that Dr. Williams' sets of semaphore test cards fail to fulfill their intended sphere, as they do not resemble semaphores sufficiently.

The addition of the colored blades in this set has no special significance in cards No. 1 and No. 2, as the position of the blade governs the engineman, but as all semaphore blades are painted some color, usually red, green, or yellow, these figures were so colored to represent existing conditions. It will be noticed, however, that the blades have different ends, i. e., square, forked, or fishtail, pointed and rounded (concave or convex). These have a special indication, but at 2640 feet they can hardly be determined; the square end is usually used for home signals at interlocking plants and with the new style train order signal. The fishtail end for distance signals, and the pointed ends on some roads for train order signals.

With card No. 3, the color of the disc exposed gives the indication. With this card the person examined should not be required to name the colors, but should state whether the indication is *danger*, *caution* or *clear*. The reason for this is ignorance of the names of colors displayed by many men examined; they may be able to perfectly match the Holmgren wools, but if asked to name a color, are completely at a loss.

It would seem a good idea in using the Holmgren wool test in the examination of railway employes to have three boxes marked "danger," "clear" and "caution," and have the person examined place in these boxes all the various colors and shades of colors indicating such conditions to him. The results obtained would be the same as in matching the test skeins. Asking the name of the color in the lantern test should also be changed to requiring the one examined to state whether the color shown indicates "clear," "caution," or "danger." As many roads are using green for clear, and yellow for caution, the addition of various tints and shades of yellow should be included in the sets of test wools.

The reason for suggesting these changes in the methods of examinations is the fact of complaints made, not only by the men who fail, but those who pass the examinations successfully, that the methods are too severe and are entirely

foreign to conditions with which they meet in actual work and a man will feel much better satisfied if turned down in an examination in which the methods bring into use the objects he comes in contact with and the terms he uses to express his findings. These methods, however, must be scientifically correct and the present high standard of requirements maintained.

DISCUSSION.

DUDLEY S. REYNOLDS, Louisville, Ky.: I think this an eminently practical paper, worthy of its author and worthy of this Academy which promulgates it. There has been too much that is technical but impractical, and it seems to me this does away with all the objections to other forms. It is practical, in accord with the signals in use, and does away with the requirements in discriminating the details of the different shades of color, with which very few people are familiar.

ALBERT E. BULSON, JR., Fort Wayne, Ind.: This paper is certainly a worthy supplement to the excellent paper by Dr. Black, presented at the last session of the Section on Ophthalmology of the American Medical Association. Those called upon to test the visual acuity and color sense of railroad employees should be very grateful to Drs. Black, Williams, and others who have been giving the subject such extended study, and who have advanced so much new and practical knowledge regarding the work.

The visual tests ordinarily employed in the examination of railroad men, and others who must be familiar with colored signals, are not adequate for the reason that the conditions under which the tests are usually made do not sufficiently correspond with the conditions presented in actual service. The appearance of a signal as seen by an engineer will vary with the changes in weather, quality and kind of light, back grounds, and many other influences. Therefore, in determining ability to distinguish signals the tests should conform in the largest measure possible to the conditions

presented in service. That many of the signals used in railroad service are poorly adapted to the purpose for which the signals are intended, seems thoroughly proven by the observations and investigations of Dr. Black, and his recommendations and conclusions should meet with favorable consideration at the hands of railroad officers.

One feature of importance in the tests of color vision is the determination of central color scotoma. An engineer or fireman who can sort out colored wools and by such tests pass a satisfactory examination may if tested with the perimeter present a well marked central color scotoma. Such a defect should at least create a doubt as to the fitness of the applicant for positions requiring quick and proper recognition of color signals.

EUGENE SMITH, Detroit: As bearing upon the advisability and desirability of doing away with the naming of colors, I have in mind the case of an old captain who had been forty years on the lakes and never had an accident, who came to me several years ago, saying he had been sent up for examination for color blindness. He could tell which was the port color and which the starboard, but he could not name red or green. I had to report him color blind. After forty years without an accident, he lost his position and he was incapacitated for anything else. He simply could not tell one was red and the other green.

J. A. DONOVAN, Butte, Mont.: Dr. Smith's experience recalls a case I had where the man was practically completely color blind. He had been on that road for 36 years as an engineer and one of the best men on the road. The superintendent did not like to let him go, and the chief dispatcher went over the road at night with him and again in the day time, and put him through every kind of a test and he never made a mistake, but he could not tell blue from red in my office. The chief dispatcher assumed the responsibility and he was retained.

DR. WÜRDEMANN (closing discussion): Dr. Smith and Dr. Donovan brought out that the final test should be made in the railroad yards and with the men at their work. While we hold that they should have perfect color sense and normal visual acuity, yet there are occasions in this vocation, in

which color scotoma may be found outside of disease and toxic amblyopia. The fireman, with the fire box open, looking into the fire every minute or two, when he closes the fire box cannot immediately see well in the distance, from blinding caused by the intense glare of the furnace. The wearing of the new amber protective glass, gives relief. I wish to add that Dr. Black has traveled over 6,000 miles in a railroad cab making these observations.

NOTES ON THE USE OF DIONIN.*

THOMAS C. HOOD, M. D.,

INDIANAPOLIS, IND.

During the last decade the general therapeutist, and the specialist as well, has had laid upon his table numberless examples of the products of synthetic chemistry. Many of them have proven worthless and are forgotten. Some, while failing to measure up to the claim made for them, have, nevertheless, remedial virtues enough to warrant their addition to our formulary. Now and then a compound is met with, which arrests our attention at once by reason of its peculiar properties and profound effect. If these properties and effects, then, continue uniform and unvarying and are such as may be, with reason, applied to relieve and counteract certain pathological conditions, then we have a useful remedy which properly merits a place in our list. Dionin, I believe, belongs in this last category, along with argyrol, eucaine, holocaine and perhaps thiosinamine. It is a new drug in ocular therapeutics but its history has already been given to the profession and I shall not go into it further than to say that it is known chemically as ethylmorphine hydrochloride, a homologue of codeine, and that we owe its introduction into ophthalmic practice to Darier, who reports on it quite enthusiastically in his late book on ocular therapeutics.

He states, however, that the drug was first used in eye practice by Wolffberg of Breslau. Previously in general

*Read at the Meeting of Amer. Acad. of Ophth. and Oto-Laryng., Aug. 26, 1904.

practice it had been employed by Schroeder and Korte to combat the irritation cough of phthisis, chronic bronchitis and lung emphysema, proving, in their hands, superior to codeia. Wendell Reber and others have reported briefly on its use in diseases of the eye, and it has found favor with most of those who have made trial of it. The drug has not the power of producing local and superficial anæsthesia as do cocaine and holocaine, but is rather to be classed as a deep analgesic, with an action which is usually prompt and prolonged. Its effect is also considered to be to a marked degree resolvent and absorbent. If now we have in it a remedy which will relieve the intolerable pain in those ugly cases of inflammation of the iris and ciliary region alone, where atropine fails, as it sometime does, then certainly it must prove a very valuable addition indeed.

It has not only done this for me but it has in a number of cases, I feel sure, materially shortened the course of the attack and helped to remove lymph deposits and exudates, the usual debris which such inflammatory storms are prone to leave behind to cloud and perhaps permanently damage the vision. Its mode of action is still somewhat problematical, but there occurs, immediately upon the instillation of a three or five per cent. solution, a dilatation of the conjunctival capillaries and a marked increase in the current of the lymph streams and the size of their channels together with a very considerable transudation of serum under the scleral conjunctiva so that there is an appearance of chemosis, with a slight transitory smarting, which latter subsides in a few minutes. This transudation is presumably taken up by the larger superficial capillaries of the conjunctiva so that in the course of two or three hours the eye resumes, for the most part, its previous aspect. Whether the prompt relief from pain which follows its instillation, in most cases, is due to this sudden depletion of the deeper structures of the eye or to an obtunding effect upon the sensory nerve endings therein is not yet definitely made out, but the empirical fact is well established. It is readily soluble in water up to fourteen or fifteen per cent. and its solutions do not soon deteriorate.

I have not been able to note any difference in the effect

from 5 per cent. up, except in the matter of smarting. The stronger solutions hurt more.

A solution of 5 per cent. is probably the best strength to use and one instillation every twenty-four hours has ordinarily sufficed, in my experience.

The fact that its effect diminishes with each application has been observed, but I can not agree with the statement that its lymphagogue action is exhausted in two or three days. I have seen it produce the usual œdema and puffiness when used for the fifteenth time on as many consecutive days.

The reaction following its use varies in intensity with different individuals and it is always well to instruct each patient as to what the immediate and ultimate effects will be and somewhat of the rationale of its action, else they may be frightened and not return.

The summary of Reber is as good as any I have yet seen and coincides with my own experience so far as that goes.

1. It is an analgesic of no little power.
2. The action of atropine seems to be enhanced by it.
3. That it has upon the eye a powerful vaso-dilator and lymphagogue action.
4. That it is of value in promoting the absorbtion of exudations, deposits in the pupilary space, and of post-operative debris after cataract extraction.
5. That it helps clear up corneal opacities in some cases of interstitial keratitis.
6. That it seems without effect in all other forms of corneal opacity.
7. That its influence on the glaucoma process is yet unsettled.
8. That it should be widely used and the results reported in order that a final correct estimate of the value of the drug may be made.

The cases which I wish to report comprise two cases of marginal keratitis with ulceration (Abbott, Keefer), one case of interstitial keratitis following varicella (Perrine), three cases of iritis with complications (Bals, Cox, Perkins), two cases of post-operative trouble following lens extraction (Leisman, Smith), and one case of keratitis following severe lime burn (Dourman).

Case 1. Mrs. H. A., age 19. Health otherwise fair. Presented a small but rather deep ulcer at the limbus of the lower outer quadrant of cornea of left eye with an area of infiltration involving several millimetres of cornea and a corresponding area of episcleral thickening, no iritis. Treated by family physician for one week previous to consulting me, with one grain atropine and hot bathing which failed to relieve the severe pain and had no effect on the ulcerative process. Pupil only moderately dilated. Atropine sol. increased to two per cent. and ulcer touched with pyoctanin. Four days later, pupil fairly well open, pain somewhat less severe but patient still had to resort to morphine for sleep. Continued atrop. and hot fomentations. Applied Dionin Sol. 3 per cent. with entire relief from pain in half an hour and the relief was maintained by one instillation on every alternate day and at the end of ten days the ulcer was entirely healed while in five days more the eye was clear of all redness.

Case 2. Helen P., age 7. April 15th. Had Varicella two weeks ago. Right eye red and sensitive to light ever since, has marginal ulcer in lower and outer quad. Treat. Pyoctan. Atrop. 1 per cent. with an eye drop of boric acid and adrenalin for home use. This treatment was continued until May 17th, when the ulcer was entirely healed and the photophobia much lessened. All of the lower half of the cornea, however, had become more or less cloudy from exudate, with pin point spots of denser cloud, V = 20/200. Stopped atropine, prescribed Syr. Iodide of Iron, and began the application of 3 per cent. dionin every other day. June 1st, cornea clearing, treatment continued. June 14th, cornea still clearing. Dionin strength increased to 5 per cent. June 23rd, cloudy area reduced to two millimetres at lower border, V = 20/40. Patient left city and passed from my hands. No report since.

Case 3. Mrs. K., age 50. Was called to see this case which was in the care of a competent oculist of a neighboring city, and had received the classical treatment for two weeks with but little or no relief from the severe pain. The ulcer was large but not very deep and occupied the upper quad. of left cornea and there was a mild iritis.

Dionin 5 per cent. was added to the treatment. One week later a report from the doctor in charge stated that the

patient was free from pain and ulcer healing. A second report ten days later said ulcer was entirely healed and patient grateful.

(Note) Patient had a malarial toxaemia for which she was receiving the proper treatment, mainly quinine in large doses.

Case 4. Mrs. J. B., age 21. Feb. 16th, '04. Iritis with interstitial keratitis, right eye, beginning one week after a tonsillotomy which was followed by considerable reaction and very slow healing. No specific history obtainable. Had a uric acid diathesis. There was pain lacrimation and photophobia, with cloudy cornea R. V—10/200, L.V—20/20. Atrop. from family physician for one week lessened all the symptoms except the corneal cloudiness which was increasing. Atropine con. and K. I. gr. 15 t. i. d. added.

Mch 1st, cornea clearing. Stopped atropine and increased K. I. to 20 gr. t. i. d. V—20/120.

Mch. 10th, K. I. disagreed and patient discontinued it.

Mch. 20th. Patient returned with increased corneal trouble, V—20/200. R. Syr. Hydriodic Acid. Zi. t. i. d. and instilled dionin 3 per cent. every other day. Mch. 30th. Cornea clearing V—20/80. Treatment continued. Dionin increased to 5 per cent. Another relapse in May was controlled in the same way, and a course of salicylate of soda followed by urotropin has cleared up the case and the patient has now 20/30 vision, and a clear cornea.

Case 5. Ralph C., age 21. June 6th, '04. Iritis with ciliary involvement. Syphilis two years ago, mild attack, treated with mercury and K. I. Right eye became red and vision dim two weeks ago, V—20/80, L. V—20/I5. Iris muddy. Pupil small and irregular, almost no reaction. Floating opacities in vitreous. Moderate pain in and about the eye in the last twenty-four hours. Has taken 7½ grs. K. I. on his own initiative for a week. Hg. Protiod. gr. ½ t. i. d. Instilled apropine 1 per cent. once daily. June 9th. Pain lessened, pupil irregularly dilated, treatment continued. June 12th. Much pain since the 11th, P. M. Iritis increased. Took one ounce of blood from the temple and added dionin 3 per cent. to atropine. Protiod. continued. June 13th. Eye quiet, no pain, treat. continued. June 18th. Eye clearing, Protiod. reduced to grs. ¼ t. i. d.

other treatment continued. June 29th. Eye clear. V—20/30. Atrop. and dionin discontinued for ten days, then dionin 5 per cent. for seven days.

July 20th. Eye clear V—20/20.

Case 6. Randolph P., age 24. May 10th, 1904. Irido-chorioiditis.

Has had dim vision in left eye for nine weeks. Consulted another oculist but did not follow his advice. Denies syphilis. Had acute rheumatism at six years. In Colorado eighteen months for weak lungs two years ago. Eye red, pupil irregular, vitreous cloudy, tension normal, a typical triangular deposit of lymph dots on the posterior surface of cornea, but little pain, L. V. 6/200, R. V. 20/20.

K. I. gr. 15 t. i. d. with daily instillations of 1 per cent. atropine and dionin. May 18th, improved. L V 15/200, no pain, treatment con. May 29th. Still improving, V 20/200, treat. con. and dionin per cent. increased to 3 per cent. June 10th, redness gone, vision remains at 20/200, lymph dots being absorbed, vitreous still cloudy. June 24th. Dots have disappeared, vision still cloudy, 20/200. Stopped atropin and dionin.

July 10th. Eyeball clear, vision still interfered with by large mass of exudate floating about the axial line of the globe. Ordered K. I. gr. 20 t. i. d. for fifteen days in each month.

Case 7. Mrs. Wm. L., age 69. March 14th, '04. Senile cataract. Left eye. Combined extraction, clear pupil, counted fingers, healing uneventful until the night of the fourth day when a neighboring brook flooded the house and room of the patient and resulted in an inflammatory reaction in the globe with an iritis which caused much pain and distress for ten days in spite of the usual treatment, filling the pupil area with much exudate and seriously endangering vision. 5 per cent. dionin was then added to the atropine solution and instilled once daily for fifteen days at the end of which time the inflammation had subsided and the pupillary exudate was largely absorbed so that a dicision on May 23rd, gave the patient a vision of 20/80 with + 10. Ds.

Case 8. Charles S., age 72. May 24th, '04. Senile cataract R. E.

Combined extraction, clear pupil, healing progressed well until the seventh day when iritis developed with much pain, which was not controlled by atropine and wet cups and only yielded when a 5 per cent. solution of dionin was instilled. There was in this case little or no exudate and the final visual result was excellent. Tested on July 29th, V—20/30 with + 10 D. s. ⌒ + 1 D. c. ax. 180° and Jaeger 1. with + 16 D. s. and the Cyl.

Case 9. Carrie D., age 50. June 17th, '04. Both eyes burned by freshly slackened lime—the left more severely. R. V.—fingers at one foot. L. V.—P. l. Both the ocular and palpebral surfaces involved.

Both corneal surfaces were parboiled, the left one worse. There was swelling of the lids and chemosis—but surprisingly little pain. The usual treatment was applied and the inflammatory reactions all subsided in four weeks—but the corneae remained cloudy and the vision poor. Dionin was then used for three weeks at the end of which time R. V. was 20/30 and the left cornea had cleared so that V—20/200.

These cases do not prove much perhaps but I submit them for what they are worth towards settling the status of this remedy.

There are two other classes of cases in which, theoretically this drug ought to be of some service, when we consider its peculiar action.

They are, first, glaucomatous conditions, and, second, those forms of cataracts in which the initial degenerative changes take place in the superficial fibers of the lens and which are characterized by the well known striæ of opacity seen extending from the region of the equator toward and into the pupillary area.

The reports of results from its use in glaucoma are, so far as I know, negative, but it deserves a more extended trial.

If cataract of the lens, particularly the form just referred to, is the result of diminished and insufficient nutrition, then this remedy with its stimulating and lymphagogic action ought to assist in restoring the normal tissue metabolism.

I have under treatment and observation a few such cases but they are as yet too recent to report upon.

DISCUSSION.

A. ALT: It seems strange to me that dionin produces nothing but good results, in the hands of all reporters and in all diseases of the eye, and I must feel sorry that I have not used it oftener. But in the few cases in which I have used it, I was so discouraged that I have been almost afraid to use it again. For instance, I used it in a case of iritis. The man was suffering intense pain and I told him I had something that would quickly relieve him. I instilled myself and I gave him a 5 per cent. solution to use at home before going to bed; but instead of obtaining relief, he stated that he had much more pain than ever before, and begged me never to use that remedy again. Why this should be, I do not know. I made the solution myself. If dionin always acts in the way the doctor says, I can not comprehend why in this and several other cases it caused such great pain, even worse than the disease itself. The reader of the paper, also remarks that it might do good in cases of beginning cataract. How that can be possible I cannot understand. As soon as you see well marked striæ in the lens you have to deal with dead tissue. We cannot replace this dead tissue by normal lens fibres.

ALBERT E. BULSON, JR., Fort Wayne, Ind.: I wish to agree with the essayist in the statement that the use of dionin in certain diseases of the eye is a distinct advance in ocular therapeutics. As I have already stated in a recently published article in the *Ophthalmic Record*, I am not as enthusiastic as Darier regarding the sphere of usefulness of dionin, but I believe that the remedy is applicable in the treatment of a certain class of cases, and in a few affections will be found more beneficial than any other one therapeutic measure.

The application of a five per cent. solution once in twenty-four hours, as employed by the essayist, is altogether too inefficient and I do not think will produce desired results. In fact, the history of the cases reported by the essayist do not indicate that the characteristic dionin effect was obtained, and the results secured could just as well be attributed to the other treatment employed. To obtain the best and most satisfactory effect from dionin a solution of not less than ten

per cent. in strength should be employed and the instillations should be made once in every one, two, or three hours according to reaction produced. As Darier has already pointed out, unless you get the characteristic infiltration and marked chemosis of the ocular conjunctiva, the action of the drug is practically nil. It has been my experience, and I have used dionin quite extensively, that when chemosis of the ocular conjunctiva does not occur, no benefit can be expected from the use of the drug.

Some patients and even some diseases seem more affected by dionin than others. In some cases even the pure powder seems to produce no appreciable reaction, and in some diseases even with the reaction no beneficial effect upon the inflammatory or degenerative process can be noted. I do not believe that it has any beneficial effect in cataract or degenerative affections of the chorioid or retina. For the promotion of absorption of exudates in the pupillary area, in the anterior chamber, or even in the vitreous, I believe it has a positive action which has been demonstrated to a certainty. In the various forms of keratitis the beneficial effect it questionable. In conjunction with atropine in the treatment of iritis, particularly when the pupil is more or less occluded and adhesions are stubborn, the results are generally marvelous. It not only favors dilatation of the pupil by promoting absorbtion of exudates, but has a distinct analgesic effect and limits or controls pain. Its analgesic effect also makes it of service in conjunction with eserine in the treatment of glaucoma. Its effect in promoting absorbtion makes its use after cataract extraction advisable if any cortical matter has been left. The solutions employed, however, should not be too weak if good results are to be secured, and care should be taken to obtain a reliable preparation, as therein lies the secret of success without ill effects.

To one unaccustomed to the effects of dionin the chemosis of the eyeball and lid, which at times is very marked, may appear to be dangerous, but no disastrous results need be feared. It is the lymphagogic effect which is worthy of our recognition, but even if it had no other effect than that of an analgesic, it would prove a valuable addition to our

therapeutic resources in the treatment of many painful eye affections.

EUGENE SMITH, Detroit: I thought we had found a remedy when I read of this, but my experience is like Dr. Alt's in the hospital and in private practice. My patients all complained bitterly of the extreme suffering following a 5 per cent. solution, which lasted for hours. I imagine in one case I got some relief of the opacity. I probably did not use it long enough, but three or four weeks use caused me to throw it aside. In every instance I got the marked chemosis and such pain that the patients begged me not to use it. I used cocain previous to the use of dionin, and never found the slightest analgesic result, but the reverse. I have experimented for two or three months, as did my assistant, and we both cast it aside.

J. C. BUCKWALTER: I have had some experience, having used dionin on two different cases of glaucoma, and in both cases the pain produced was so severe that they could not continue the use of it. I ordered a 5 per cent. solution to be instilled every two hours. I performed a cataract operation, the results were perfect the first three days; after that the vision disappeared. The strength of atropine was increased from 1 to 2 per cent. to be instilled every two hours and hot applications made every two hours to continue for five minutes. This was kept up for three weeks with no improvement in vision and no clearing up of the exudate in the anterior chamber. I then ordered a 10 per cent. solution of dionin to be instilled every two hours for four days. The opacity cleared and the patient could count fingers at three feet. I have used the 5 per cent. solution in three different cases of macula of the cornea without perceptible improvement.

DR. BRIGGS: Some three years ago when Darier first published records of the efficacy of dionin, I used it extensively for some time, but I was a little sceptical, because I saw a number of other reports which seemed to prove it useful in almost every eye disease. When one finds a remedy vaunted as almost a universal medicine, he can generally conclude that it is not very useful for any disease. I have gradually used it less in the last year than I did the first year

that it was introduced and have restricted it of late to use an analgesic in cases of iritis. I occasionally use the powder, applying it to the cornea. My experience has been that it had very little influence on lesions of the cornea, but I do believe it is occasionally very beneficial in its effect on the pain of iritis. Its action is not uniform, in my experience, but it is so frequently disappointing that I have used it less and less.

GEO. F. SUKER: The efficacy of dionin in glaucoma is in proportion to the amount of tension. The pain caused by it depends largely upon its purity. The bi-products are often irritating and, unless chemically pure, it will cause a considerable amount of pain. The purest will cause some pain, but not more than some other solutions we use at the present time. It should be preceded by cocain. It does enhance the efficacy of the dilating property of atropine, especially so in syphilitic iritis with adhesions. It materially aids in absorbing the exudative materials. In cataract extraction where you have a cloudiness left in the anterior chamber because of flocculent lens remains, application of it does enhance the absorption because it is a decided lymphagogue. I use one drop of cocain first and then the 5 per cent. solution of dionin—never stronger than that—a drop every hour or so, into the conjunctival sac, until there is a marked chemosis, and then add one more drop for safety. Then I allow the patient to rest and, if necessary, apply iced compresses to counteract the extreme chemosis. As to its analgesic effect, I am undecided. As regards its lymphagogic action, it is certainly a decided addition to our therapeutics in ophthalmic practice.

H. V. WÜRDEMANN: The testimony given by the several deponents in this case seems to show that this affiant, dionin, is on trial for its life. My experience with it for the past two years is that it is a positive analgesic, antiseptic, local alterative, and a lymphagogic of strong action. Its effect is only to be gained in strong solutions of the pure drug applied frequently. Its affect passes away and cannot be obtained again for three or four days, so that we have to have an interval before we can get an effect with this drug again.

This effect depends upon the amount of reaction we get, the amount of chemosis or exosmosis produced.

MELVILLE BLACK, Denver: I am skeptical about the value of a new drug, and I am like the man from Missouri, "I've got to be showed." But I have been agreeably disappointed in dionin. It certainly has met the claims of those who have been its strongest advocates. I am surprised there should be this extreme difference of opinion. Those who have been disappointed in it seem to have gotten no results at all, while others find it a very valuable agent. However, we all differ in the way we use drugs, and drugs differ in their strength, in accordance with the manufacture. It would seem that those who are getting results are using a different preparation from those who get none or are using it differently. Würdemann has struck the key-note when he says the greatest effect is in the beginning. If one watches it closely he will find the greatest chemosis from the first application. The chemosis gradually subsides and becomes less and less in subsequent applications. It seems to me every two hours is too often to use the drug, because we do not get complete recession of the chemosis in the interval and in consequence the drug soon ceases to produce any reaction. I use it every five or six hours for a number of days. As soon as it ceases to cause reaction, stop it for a few days, and then begin its use again. We will get a more prolonged action if it is not used too frequently. It seems to me it would be well to bear this fact in mind, that if you wish to prolong the action of this drug, you must not use it every two hours. In chronic cases I have used it two days on and two days off. By so doing the reaction it produces can be seen for several weeks.

J. M. RAY: One point in connection with the use of dionin brought to my mind by the last two speakers is in regard to the thickening of the conjunctiva, while the chemosis will disappear in a few hours, there is a soggy, water-logged appearance of the conjunctiva for several days. In several cases I have seen a certain amount of extravasation of blood into the tissues under conjunctiva, and this remains a day or two.

DR. HOOD (closing discussion): I did not wish to convey the idea by these few cases reported that dionin is a cure-all. It is not. Only perhaps three or four classes of cases were represented by the cases reported, and the point mentioned by my friend Dr. Bulson in regard to testing the susceptibility of the eye of the individual is one I would emphasize. You must have the chemosis or there is not much effect, analgesic or otherwise. I feel gratified that the paper elicited the full discussion that it has. I think we are advancing in our knowledge of this drug, and I hope the reports we may get will soon settle its status.

SOME UNIQUE CASES OF AMBLYOPIA.

DR. T. W. MOORE,

HUNTINGTON, WEST VA.

At the time I selected this subject, I did so to report three cases of transient amblyopia without fundus changes occurring in children between the ages of ten and eighteen, presenting no special features of nervous debility and without neurotic family histories.

Since that time Dr. L. Webster Fox has reported several cases of the same type under the title Anaesthesia of the Retina, in a paper read before the ophthalmological section of the American Medical Association. His patients were all young girls, who were healthy and all were cured after a few applications of the constant electrical current.

Case 1 of my series came to me in March, 1903, complaining of having suddenly lost her vision, being unable to see either far or near, and having been compelled to give up her schoolwork on this account. I found a healthy, active, full blooded girl, aged eleven years. Pupils reacted normally, vision in each eye = 10/200, accepting no lenses. Under

*Read at the Meeting of Amer. Acad. of Ophth. and Oto-Laryng. Aug. 26, 1904.

atropine, vision remained the same, but with a + .50 ⊂ + .50 cyl. ax. 90° over each eye she read 20/80. Her field for white was contracted in all directions as it was for colors, the normal relationship being retained, a second examination at this time remained practically the same. The media and fundus were normal in both eyes.

I gave strychnia, and iodide of sodium, with instructions for patient to return in three weeks. I received word that she was much better but did no see her again until December, when I found her condition practically unchanged. This continued until after my return from the meeting of the American Medical Association, when I began using the galvanic current for five or six minutes daily, the sponge electrode being moved across the forehead and over the closed lids and temples. Her vision when I began treatment was R. E. 10/150; L. E. 5/150, she being unable to read 11 Jaeger near. I tested her with different cards at different distances and obtained always the same results, although she did at times complain of being unable to see anything, but after a few minutes rest she would read the letters to the limit of her vision. On June 23rd, 1904, after using the current five minutes, vision improved from 14/200 in R. E. to 20/200; in L. E. from 7/200 to 10/120. On June 24th, after using the current five minutes the vision was the same as the day before. On June 25th, after using the current five minutes vision = 20/80 with both eyes. Patient was taken to the country on this date, returning on the 30th, when after using the current five minutes she read 15/50 with both eyes. On July 2nd, after six minutes treatment she read 15/20 with both eyes; on the 5th 15/15, on the 7th 15/15 +, reading Jaeger 1 at twelve inches. Fields normal. Repeated measurements of the field of vision showed that there was an increase in all directions as the vision improved, the field for red increasing also but retaining its normal relation in the left eye, but in the right eye the field was never as much contracted as in the left, retaining almost its normal size at all times.

Case 2.—S. P. Schoolgirl, aged 17, came to me in January, 1903. Vision, R. E. 20/200; L. E. 20/120, unimproved by glasses. Retinoscopy showed the refraction to be + .50

sp. R. E.; + .25 sp. L. E. Patient went to the springs and returned with vision, R. E. 20/120; L. E. 20/40, this was eight months later. One month later with + .50 vision = 20/30 in each eye. There was at no time any abnormality in the media, the only symptoms being failure of vision, sensitiveness to light and the contracted fields.

This case was of especial interest to me because a brother six years before had been examined by a well known ophthalmologist who made a diagnosis of disease of the optic nerve that would lead to total blindness in a short time, and to my knowledge the patient had to be led about for several months, and was finally cured by "blood medicine" compounded by an uncle who calls himself an eclectic.

Case 3 was a boy aged ten, inclined to be nervous without any special manifestations. Parents healthy as are his brothers and sisters. No headache, vision suddenly failed so that he was unable to study, vision = 20/40 unimproved in both eyes when first seen, June 7, 1902. A few weeks later his vision was 20/20 both eyes—three letters. On August 21, it was 20/60 both eyes, nine days later it was 20/30? both eyes. One year later he was no better. His fields were contracted when the vision was bad, the normal color relationship being maintained and normal when he read 20/20. Ophthalmoscopic finding were at all times normal.

Heretofore, gentlemen, it has been the custom of ophthalmologists to classify these cases as belonging to that symptom complex "hysterical amblyopia," and as that term has been used to designate every visual defect that could not be explained by pathological findings—I suppose that it is the correct one—and further it lessens the shock to our sensibilities by having it gradually dawn upon us "that there is something wrong and we do not know what it is."

I wish to emphasize a few points in my cases in which they differed from the usual hysterical manifestations.

First, the fields for white in these cases have varied with the visual acuity instead of being contracted disproportion ately, and the color limits have retained their normal rela tionship instead of being reversed as they so frequently are in the neurasthenic types.

My cases as well as those reported by Dr. Fox all oc

curred between the ages of ten and eighteen years—the ages when hysterical symptoms are most prone to manifest themselves, and whilst all of his and two of my cases were in females, it is known that the members of that sex do apply themselves to their books more assiduously than their brothers.

Hysteria is so frequently monocular, in these cases both eyes were involved and to almost the same degree.

I made very careful tests in Case one to determine as to the counter field described by Wilbrand and found it absent, and further the fact that my cases and those of Fox occurred in young subjects and not in hysterical women with ovarian and uterine disorders, as he states his cases were most frequently found.

If neurasthenia is abnormal susceptibility of the system to fatigue from mental or bodily exertion, this broad term may express the origin of this condition which I believe to be an arrest of the functional activity of certain retinal cells occurring at or about the time of puberty, when the entire nervous system is at high tension and when with our forcing system of education the eyes are apt to be overworked, more particularly in those subjects who have slight refractive errors for the reason that they receive no warning in the way of headaches, etc.

The remedy for this from Fox's report and my experience with the one case, after other measures had failed, is the constant current which seems to stimulate these torpid cells into renewed activity.

I do not think that retinal anæsthesia is a good term owing to its use by different authors for varying conditions none of which were in accord with the symptoms here described, Retinal Torpor might be a better one.

COFFEE AMBLYOPIA.*

By Albert E. Bulson, Jr., B. S., M. D.,

FORT WAYNE, IND.

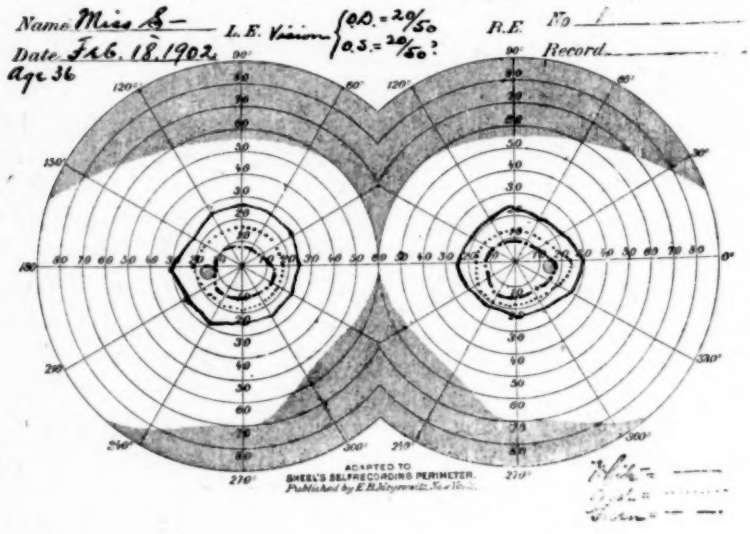
Among the substances which may, through toxic action, produce amblyopic symptoms, unaccompanied by demonstrable retinal or optic nerve lesions, coffee may be included, though ophthalmological literature contains but few and brief references to the subject. Among modern writers de Schweinitz (1) Ball (2) Wood (3) and a few others mention coffee as capable of producing toxic amblyopia, but no particulars are given. Hutchinson (4) reports having seen a case of coffee amblyopia which resembled quinine amblyopia, while Wing (5) reports in full, with perimetric charts, the history of an exceptional case of coffee amblyopia in a patient but eight years of age.

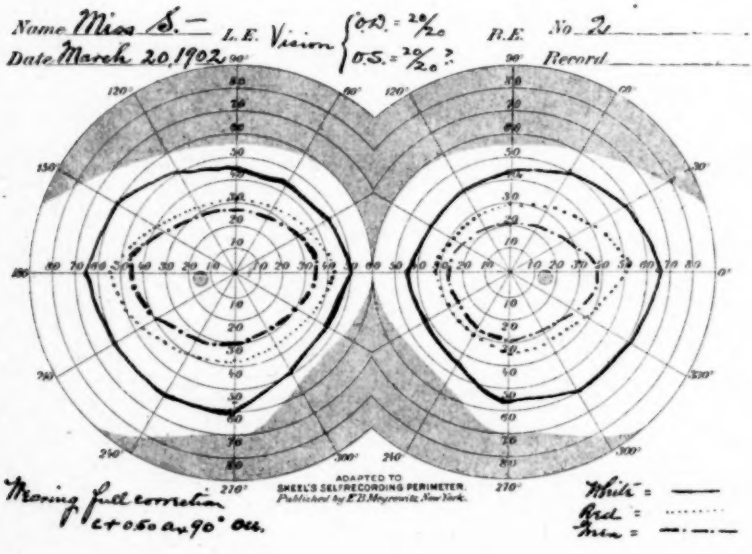
The experiments and observations of the writer seem to warrant the belief that visual disturbances of mild form as a direct result of the use of coffee are relatively more common than generally supposed, and that pronounced amblyopia, with contracted visual fields, in those who use coffee to excess, is not a rare condition.

The manner in which the visual disturbance is produced is somewhat in doubt, though the theory advanced by Casey Wood (6) that it is occasioned by a ptomain poisoning generated as a direct result of the injurious influence of excessive quantities of coffee taken into the system, seems worthy of acceptance. While Luederitz (7) Rabateau and several other observers have been able to definitely establish the fact that infusions of coffee have the power to destroy various pathogenic and non-pathogenic micro-organisms, and when taken internally in certain quantities act as an agent to restrict the growth of pathogenic organisms in the intestinal canal, it is equally an established fact that the excessive use of infusions of coffee produces a marked irritation of the digestive tract, thus favoring the processes of decomposition

*Read at the Meeting of Amer. Acad. of Ophth. and Oto-Laryng. Aug. 26, 1904.

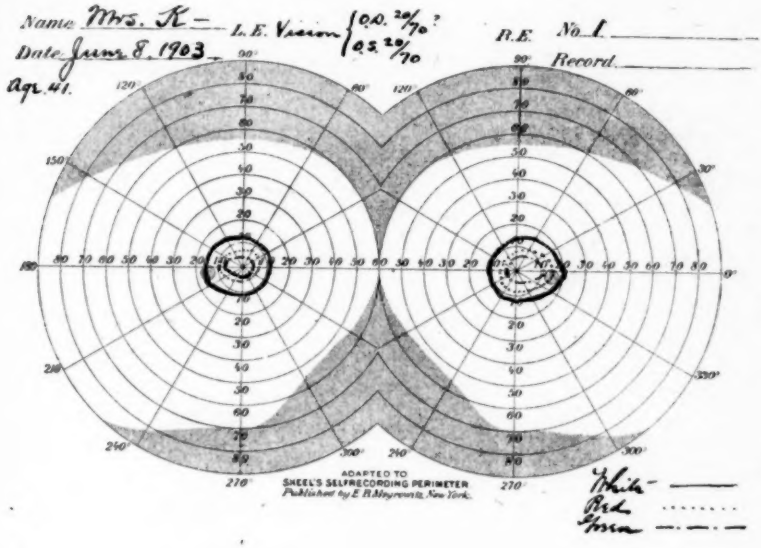
and disintegration essential to ptomain development, and this is more particularly true in those persons having a particular

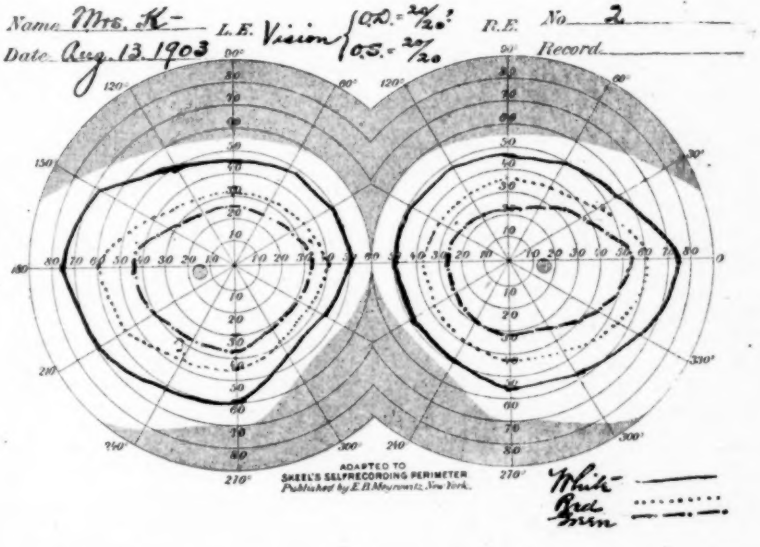




susceptibility to its effects. That the ptomains thus generated, acting through the circulation, may produce nutritive changes in the ganglion cells of the retina, or an affection of

the optic nerve, or both, seems a reasonable supposition as to the genesis of the visual disturbances accompanying the excessive use of coffee by certain persons.





The writer's attention was first directed to the subject of amblyopia as produced by coffee by the following case:

Miss S—., dressmaker, age 36, consulted me Feb. 18,

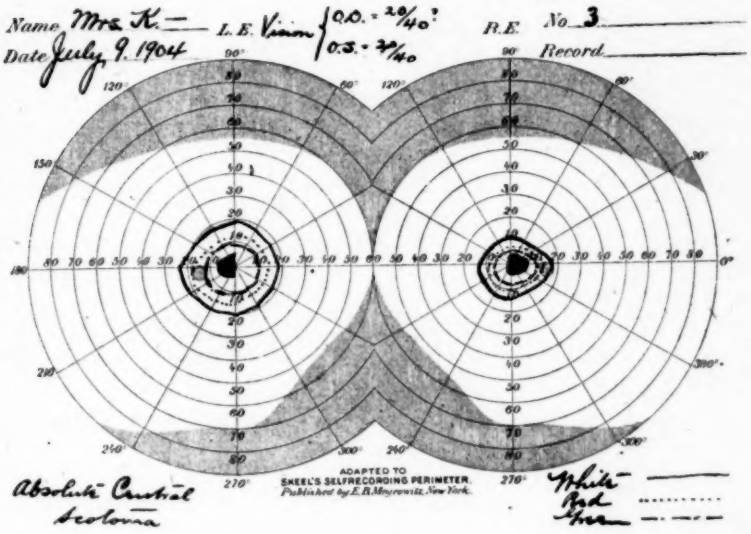
1902, with a history of failing vision dating back three months. On the supposition that glasses were all that was required for relief, a local optician had prescribed concave sphericals of one-half dioptre without beneficial effect. On examination vision was found to be 20/50 each eye, and not improved by lenses. Conjunctiva, cornea and iris normal. Ophthalmoscopic examination negative. A test of the field of vision disclosed concentric contraction of the field in each eye for all colors, as indicated by the perimeter chart, but with no discoverable scotomata.

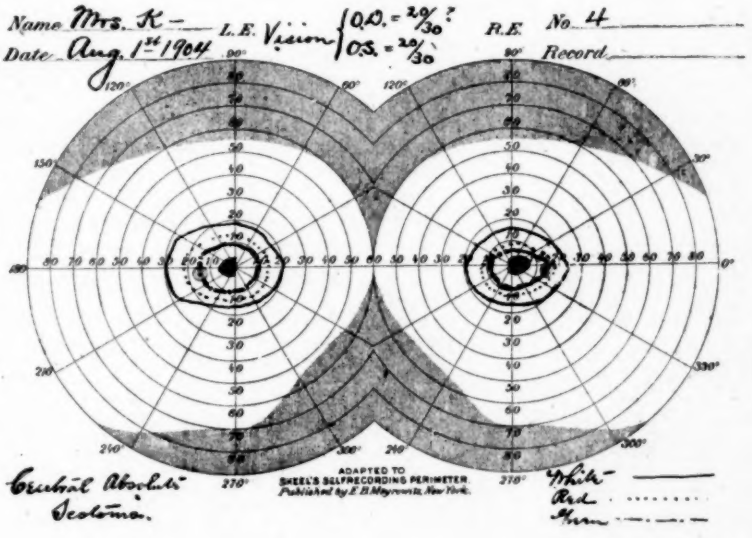
Upon questioning the patient the fact was brought out that for several months large quantities of strong coffee, averaging ten to twelve cups per day, had been drunk, much of it during working hours when it was taken in place of the mid-day meal. The patient also suffered from poor appetite, disturbed digestion, constipation, and marked nervousness. admitted that for two months she had been drinking coffee again, and of late in quantities nearly as large as formerly. There had also been a return of the headaches, eye pain Headaches and attacks of "dazzled vision" were of almost daily occurrence. Examination of the urine negative.

The patient was directed to totally abstain from the use of coffee, and was given pilocarpine sweats, and daily hypodermic injections of strychnine in increasing doses, beginning with 1/20 grain. At the end of one week the vision had increased to 20/30 plus, and the fields had decidedly widened. At this time the pilocarpine treatment was discontinued, but the strychnine was continued in doses of 1/20 grain, in tablet form, after each meal. At the end of four weeks the fields of vision were approximately normal, and vision 20/20 each eye. The digestion and condition of the bowels had also improved. Patient then disappeared from observation and was not again seen until four weeks ago when she returned by request for report as to condition. There has been no return of the trouble. The use of coffee has not been resumed.

A more definite proof of the fact that coffee may be responsible for visual disturbance was found in the history of the following case in which a relapse occurred as a direct result of the resumption of the use of coffee:

Mrs. K., housewife, age 41, consulted me June 8, 1903. She reported that for several months she had noticed im-





paired vision but that the condition had grown much worse during the previous three or four weeks. During the latter period she had suffered from nervousness, headaches, poor

appetite, and indigestion. Also complained of attacks of violent twitching of the eye-lids, accompanied by spots before the eyes. Patient reported that for two or three years she had been accustomed to drinking large quantities of strong coffee which she took at varying intervals during the day from the coffee pot which was constantly kept filled and on the stove. She said she depended upon coffee to sustain her.

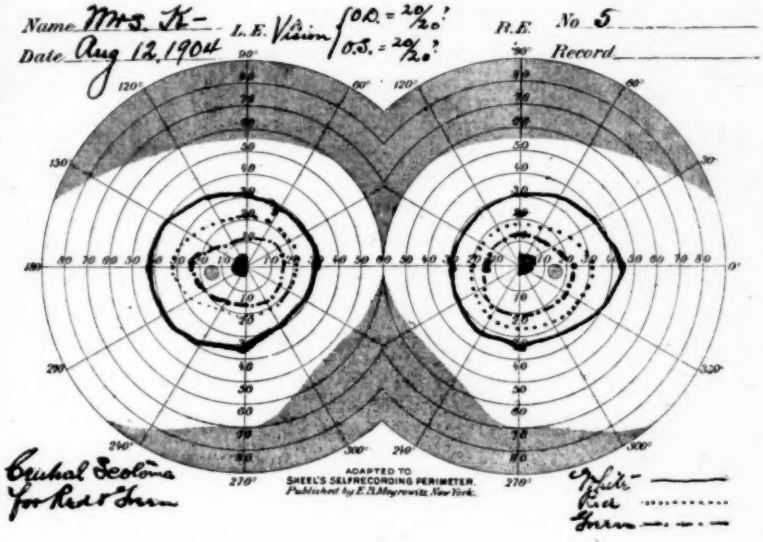
On examination both eyes were found fairly normal in appearance, with the exception that the pupil reacted a little slowly to light and accommodation. Vision 20/70 each eye, and not improved with lenses. Media clear. Fundus of each eye presented a slight pallor of the temporal half of the disc, and haziness of the edges, but otherwise normal. Field of vision in each eye decidedly contracted concentrically for all colors, as indicated on the perimeter chart, but no scotomata. Examination of the urine negative.

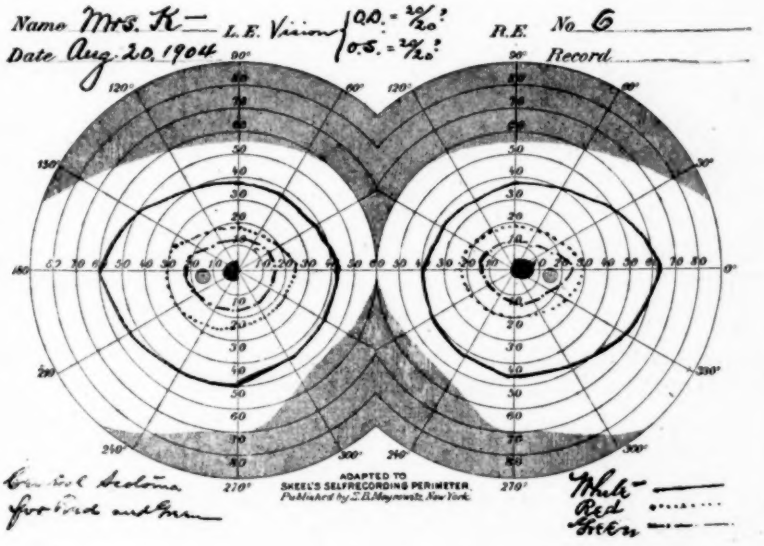
The patient was directed to abstain from the use of coffee, and pilocarpine sweats and strychnine were prescribed. Under the treatment the vision steadily improved and the fields of vision widened until on August 13th, when the patient was discharged, the conditions were essentially normal.

The patient was not seen again until July 9, 1904, when she returned complaining that her vision had within two or three weeks become affected much as it was at the time of the first consultation over one year before. She reluctantly admitted that for two months she had been drinking coffee again, and of late the quantities nearly as large as formerly. There had also been a return of the headaches, eye pain upon use of the eyes, and "flashes of light." Vision 20/40 each eye, and fields contracted essentially to the same extent as in the former experience. At this time a small absolute central scotoma was discovered.

The patient was again placed on treatment consisting of pilocarpine sweats, strychnine, and abandonment of the use of coffee. Improvement was slower than in the first attack, and at the end of three weeks vision had only increased to 20/30, fields of vision had not widened to any great extent and the central absolute scotoma persisted. At a recent

examination, Aug. 12, 1904, the vision was 20/20 minus in each eye, the fields of vision increased to about one-half





normal, and the central scotoma changed to one for red and green only. The patient is continuing the same treatment, with the addition of potassium iodide in 15 grain doses.

In view of the discovery of a small central scotoma in the last case during the second attack, it is reasonable to presume the possibility of the existence of a similar manifestation during the first attack, and perhaps also in the first case reported, but overlooked owing to lack of extreme care in the perimetric examination.

These two cases of coffee amblyopia, coming under observation within a few months of each other, led the writer to undertake a series of experiments upon himself, and observations with reference thereto, as to the toxic effect of coffee upon the visual apparatus. It had long been known that the subject was particularly susceptible to the influence of strong coffee in certain quantities not ususally considered excessive. An attempt was made, therefore, to induce, if possible, a mild coffee amblyopia. Beginning with the addition of four to six cups of strong coffee to the usual allowance of one or two cups of moderately strong coffee taken at the morning meal, the quantity taken per day was rapidly increased until it exceeded twelve cups. At the end of two weeks the use of coffee was discontinued on account of excessive nervousness, persistent insomnia, anorexia, gastro-intestinal disturbances, and dull headache. During the first week of the test nictitation developed and increased in persistence until at the end of an additional five or six days it became almost unbearable, and undoubtedly contributed to the general nervousness. There were also asthenopic symptoms upon prolonged eye-work. Visual acuity was not affected until the day the test was abandoned, when the usual 20/15 vision for each eye was found to be barely 20/20. The field of vision in each eye however, was found contracted concentrically to an appreciable degree three days before the use of coffee was abandoned, and the contraction slightly increased during the succeeding three days. Careful and painstaking perimetric examination failed to disclose the existence of scotomata. Only two fundus examinations were made, by a confrère, and at neither examination could there positively be detected any injection of the retinal vessels, though the temporal half of each disc appeared to have a slight pallor and the edges of the discs were somewhat hazy. With the suspension of coffee drinking the disagreeable symptoms disappeared, but

return to normal conditions was probably hastened by strychnine 1/20 grain, three times per day, which it was deemed wise to take in view of the general nervous debility existing.

A peculiar feature in the experience was the quieting effect which tobacco had upon the irritable nervous system. When affected with a general nervousness which precluded the possibility of being quiet for even a short period of time, the smoking of a cigar had a decided quieting effect. The possibility of tobacco being a factor in the case is recognized, but in view of the cessation of the ocular manifestations following the withdrawal of the coffee, it seems reasonable to suppose that the coffee was responsible for the mild amblyopia.

Hutchinson reported that his case resembled quinine amblyopia, in which case there presumably was marked contraction of the retinal bloodvessels and pallor of the discs. In Wing's (9) case there was congestion of the optic discs, enlargement of the retinal veins but contraction of the arteries. In the two cases observed by the writer, one of which was seen during a recurrence, no perceptible contraction of the retinal vessels could be distinguished, and aside from a slight pallor of the temporal half of the discs and faint haziness of the edges of the discs there were no fundus changes discoverable by ophthalmoscopic examination.

It is presumed that with more extended observation in a larger number of cases the manifestations will vary, much as the manifestations vary in tobacco amblyopia. The more important point to be considered is the recognition of the possibility of coffee being the cause of a toxic amblyopia as well as many of the asthenopic symptoms which at times seem of obscure origin. Considering the almost universal use of coffee as a beverage it is thought that cases of coffee amblyopia are not relatively uncommon, but when occurring will be found in persons particularly susceptible to the toxic influence of coffee when taken to excess. It is also thought by the writer that women, with their more sensitive nervous systems, mode of living, and increased tendency to use such beverages as tea and coffee to excess, will be found most often suffering from the affection. Such cases, judging from observations made, will probably be also accompanied in nearly every instance by gastro-intestinal disturbances,

and various neurasthenic manifestations not the least of which will be asthenopia.

Treatment of the condition is obvious. The use of coffee should be discontinued. Elimination by means of the pilocarpine sweat seems of undoubted value, and this should be supplemented with strychniñe internally in fairly large doses. The latter should be increased to the point of tolerance if central vision does not rapidly improve and the fields of vision widen. In the less pronounced cases discontinuance of the use of coffee alone may be sufficient to bring about improvement, and especially if proper dietary and hygienic regulations are followed.

Judging from the second case here reported it would seem that coffee amblyopia having once occurred, relapses may be occasioned by resumption of the use of the beverage in even moderate amounts.

REFERENCES.

1.—System of Diseases of the Eye, Norris and Oliver, Vol. IV.
2.—Modern Ophthalmology.
3.—N. Y. Medical Record, Vol. 48, 1895.
4.—Centralbl. f. Aug. 1887.
5.—Annals of Ophthalmology, April, 1903.
6.—N. Y. Medical Record, Vol. 48, 1895.
7.—Quoted in Merck's Archives, July, 1904.
8.—Centralbl. f. Aug. 1887.
9.—Annals of Ophthalmology, April, 1903.